

MEMORANDUM

CH2MHILL

Bunker Hill Mine Water Failure Modes and Effects Analysis—Proposed Annotated Outline

TO: Mary Kay Voytilla/USEPA
FROM: Jim Stefanoff/CH2M HILL
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This memorandum provides a proposed annotated outline for the Bunker Hill Mine Water Failure Modes and Effects Analysis (FMEA). A FMEA is a process for evaluating a system, component by component, to identify potential failure modes, corresponding effects of those failures, and actions to prevent the failures. For this FMEA, failure would be defined as the release of untreated or partially treated acid mine drainage (AMD) to Bunker Creek. Failures associated with uncontrollable events such as major earthquakes or floods would not be considered.

I. PURPOSE AND OBJECTIVES

The purpose of the Bunker Hill mine water FMEA would be to identify and prioritize mine water management system improvements or actions that could be implemented to prevent the release of untreated or partially treated AMD to Bunker Creek.

The FMEA would provide information to support the following:

- Prioritizing new remedial actions given initial and subsequent incremental funding
- Identify contingency measures for preventing releases
- Identify operation and maintenance (O&M) approaches and support the development of a mine water management O&M plan for the overall mine water control system

II. APPROACH

A. Scope of FMEA

The FMEA would consider each existing component of the mine water management system. The components would be consistent with those used in the remedial investigation/feasibility study (RI/FS), and would consist of AMD Mitigations, AMD Collection, AMD Conveyance, AMD Storage, AMD Treatment, and Sludge Management.

B. Type of FMEA

The FMEA will use a relative rank approach for prioritizing failures, effects, and associated corrective or preventive actions. For example, the severity of a failure could be ranked as either catastrophic, critical, marginal, or negligible,

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and the likelihood of a failure as either frequent, probable, occasional, remote, or improbable.

C. Conducting the FMEA

The FMEA would be brainstormed at a working meeting (likely 2 days), attended by the mine water project team. Each component would be discussed and evaluated. Prior to the meeting, CH2M HILL would take the first cut through the components to identify the individual pieces and equipment to be evaluated. We would prepare short descriptions of each, and develop working sheets for the group to use. Some of these would be poster-size.

Categories to be assessed by the group for each component or piece of equipment would be failure modes, causes, effects, existing protections (existing actions, infrastructure, or equipment that prevents or reduces risk), relative risk rank (risk index), new actions (new actions, infrastructure, or equipment that prevents or reduces risk), and then a new risk index if new actions were implemented.

A prioritized list of the new actions to be implemented would be the goal of the meeting.

III. DOCUMENTATION

Following the working meeting, CH2M HILL would prepare a technical memorandum summarizing the FMEA. This would be prepared in draft form for review and comment by the group, and then as final.

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